### SAN FRANCISCO FORECAST DISTRICT.

The month was marked by heavy storms along the Pacific coast north of San Francisco; south of San Francisco there were several dates of comparatively heavy rainfall and moderate winds.

Warnings of rain were furnished to the raisin growers of the San Joaquin Valley, but owing to the low temperature and frequent showers much of the last crop was sent to the wineries. The service of the Bureau was satisfactory and many compliments were received from growers and others.

The month was especially trying on the commerce of the coast. At the beginning of the month conditions were favorable for fog, and inbound vessels were delayed. From the 5th on, the winds were generally from southeast, and a large number of vessels were known to be off shore but were unable to make their desired harbor. Nearly all of these vessels came into port after long and trying voyages.

About the middle of the month a succession of low areas began impinging the coast between the parallels of 40° and 45°. These were generally accompanied by rain over northern California and high southeasterly winds from Cape Mendocino northward. Storm and information signals were displayed in connection with these low areas. Light frosts were forecast successfully on the 23d and 24th.—*A. G. McAdie, Forecast Official.*

### PORTLAND, OREG., FORECAST DISTRICT.

The gales along the coast were almost continuous from the 18th to the close of the month. The gales were anticipated by displays of the storm signals, and the signals ordered were in every instance verified.

River forecasts for the Willamette were issued from the 27th to the 30th, and were of great value to merchants and others in Portland.—*B. S. Pague, Forecast Official.*

On the 2d and 3d warnings of heavy frost for Texas were supplemented by I. M. Cline, Section Director, Galveston, Tex., with frost warning for the sugar and trucking regions of Texas. As a result of these warnings the saving of seed cane was rushed to completion, truck gardens were protected as far as practicable, and many of the tender crops were saved from injury,

### HAVANA FORECAST DISTRICT.

On the morning of the 9th Cuban stations and Kingston, Jamaica, were notified that a storm was apparently central south of eastern Cuba. In the afternoon the Jamaica cable service was interrupted. At 4:00 p. m. Santiago and Puerto Principe were informed that the storm was moving north-northwest and that rains and high southeasterly winds backing to easterly were indicated for eastern Cuba, and all Cuban stations warned of rains and high winds.

Reports from Kingston dated the 8th, received the afternoon of the 9th, indicated very stormy conditions near that place, and cablegrams to newspapers in the United States confirmed these reports. No authentic reports of reported damage on the Island of Jamaica on the 8th have been received.

High seas were reported outside on the 26th, undoubtedly due to the passage northeastward of a storm which was central near New Orleans, La., on the morning of the 25th.—*W. B. Stockman, Forecast Official.*

### AREAS OF HIGH AND LOW PRESSURE.

During the month there were nine highs and ten lows that were sufficiently well defined to be traced on Charts I and II, respectively. The following table gives the principal facts regarding the place of origin and of disappearance, of duration and velocity of these highs and lows, and the following description is added.

*Highs.*—Only three of the highs were first noted near the middle Pacific coast, Nos. III, VIII, and IX. Nos. I, IV, V, and VI began to the north of Montana, or very near there. No. II began in Manitoba, and was like an offshoot from No. I when it reached North Dakota. No. VII began in South Dakota. The general course of these highs was eastward. No. III was last noted in Wyoming where it remained stationary for several days before losing its entity. Nos. VIII and IX disappeared in Ontario. No. V, in Tennessee, and Nos. I and VII off the south Atlantic coast, and Nos. II, IV, and VI were last seen off Nova Scotia or the north Atlantic coast.

*Lows.*—Four of the lows were first noted on the Pacific coast. No. VII in southern California, and Nos. V, VI, and IX on the north Pacific coast. No. II was first seen to the north of Montana, Nos. IV, and X, in Wyoming, and No. III in Iowa. No. VIII began on the west Gulf coast, and No. I in Alabama. The general path of these lows was east or northeast. No. IX was last noted over Lake Superior. No. IV in Ohio, Nos. VII and VIII off the south Atlantic coast, and the remaining six in the Gulf of St. Lawrence. Very few high winds were reported in connection with these lows. On 8 p. m. of 3d, as low No. I approached the middle Atlantic coast, Sandy Hook reported an east wind of 60 miles an hour. The next morning Block Island experienced an east wind of 48 miles. On a. m. of 12th, as low No. III moved up the middle Atlantic coast, Sandy Hook reported northwest wind of 48 miles, and that evening New York, N. Y., and Woods Hole reported northwest winds of 48 miles each.—*H. A. Hazen, Professor.*

*Movements of centers of areas of high and low pressure.*

| Number. | First observed. | | | Last observed. | | | Path. | | Average velocities. | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Date. | Lat. N. | Long. W. | Date. | Lat. N. | Long W. | Length. | Duration. | Daily. | Hourly. |
| High areas. | | ° | ° | | ° | ° | *Miles.* | *Days.* | *Miles.* | *Miles.* |
| I | *30, a. m. | 52 | 119 | 11, a. m. | 33 | 80 | 4,680 | 12.0 | 390 | 16.3 |
| II | 1, p. m. | 52 | 95 | 4, a. m. | 45 | 60 | 1,860 | 2.5 | 744 | 31.0 |
| III | 4, p. m. | 41 | 126 | 7, a. m. | 42 | 107 | 960 | 2.5 | 384 | 16.0 |
| IV | 9, a. m. | 54 | 111 | 15, p. m. | 45 | 58 | 3,780 | 6.5 | 582 | 24.2 |
| V | 12, a. m. | 51 | 116 | 15, p. m. | 36 | 86 | 2,340 | 3.5 | 669 | 27.9 |
| VI | 15, a. m. | 49 | 103 | 18, a. m. | 43 | 70 | 2,400 | 3.0 | 800 | 33.3 |
| VII | 18, a. m. | 44 | 100 | 21, p. m. | 35 | 75 | 1,920 | 3.5 | 549 | 22.9 |
| VIII | 19, p. m. | 43 | 125 | 22, p. m. | 49 | 84 | 2,100 | 3.0 | 700 | 29.2 |
| IX | 22, a. m. | 40 | 121 | 25, p. m. | 48 | 79 | 2,220 | 3.5 | 634 | 26.4 |
| Total | ... | ... | ... | ... | ... | ... | 22,260 | 40.0 | 5,452 | 227.2 |
| Mean of 9 paths | ... | ... | ... | ... | ... | ... | 2,473 | ... | 606 | 25.2 |
| Mean of 40 days | ... | ... | ... | ... | ... | ... | ... | ... | 556 | 23.2 |
| Low areas. | | | | | | | | | | |
| I | 1, p m. | 32 | 86 | 5, p. m. | 47 | 56 | 2,310 | 4.0 | 577 | 24.1 |
| II | 7, p m. | 53 | 109 | 10, p. m. | 47 | 59 | 2,280 | 3.0 | 760 | 31.7 |
| III | 9, p m | 43 | 97 | 13, a. m. | 47 | 61 | 2,040 | 3.5 | 583 | 24.3 |
| IV | 12, p. m. | 44 | 107 | 14, p. m. | 40 | 84 | 1,260 | 2.0 | 630 | 26.2 |
| V | 12, p. m. | 45 | 127 | 16, a. m. | 47 | 64 | 3,120 | 3.5 | 891 | 37.1 |
| VI | 15, a. m. | 49 | 124 | 20, p. m. | 45 | 60 | 3,480 | 5.5 | 633 | 26.4 |
| VII | 17, p. m. | 34 | 116 | 23, p. m. | 35 | 75 | 3,180 | 6.0 | 530 | 22.1 |
| VIII | 23, a. m. | 37 | 99 | 26, p. m. | 28 | 80 | 1,380 | 3.5 | 394 | 16.4 |
| IX | 27, a. m. | 49 | 120 | 30, a. m. | 48 | 87 | 1,740 | 3.0 | 580 | 24.2 |
| X | 29, p. m. | 45 | 105 | †3, a. m. | 51 | 66 | 2,310 | 3.5 | 660 | 26.5 |
| Total | ... | ... | ... | ... | ... | ... | 23.100 | 37.5 | 6,288 | 259.0 |
| Mean of 10 paths | ... | ... | ... | ... | ... | ... | ... | ... | 624 | 25.9 |
| Mean of 37.5 days | ... | ... | ... | ... | ... | ... | ... | ... | 616 | 25.7 |

*October. †December.